NREL / DOE SUBCONTRACT DEVELOPMENT OF A UL STANDARD FOR THE INTERCONNECTION OF DISTRIBUTED GENERATION, QUARTERLY REVIEW MEETING

October 23, 2001

Project Update

- Progress on the research, planning, development and the expansion of the Standard For Inverters, Converters and Controllers For Use In Independent Power Systems, UL1741.

Project Goal

- Under this contract, we are using the Standards Technical Panel (STP) process with the assistance of DG industry experts to combine the appropriate safety requirements with the necessary utility interconnection requirements from IEEE 1547.
- The end result should address the needs of Electrical AHJ's and also many Utility Interconnection Engineers.

Project Lead Engineer

- Tim Zgonena - UL Sr. Project Engineer, Primary Designated Engineer for UL1741.

Additional Engineering Staff

- **NREL Technical Monitor**
  - Ben Kroposki - P.E. Sr. Engineer
- **UL**
  - Robert Pence, P.E. Associate Manager
  - Susan Malohn, Project Engineer
  - David Dini, Sr. Research Engineer
- **Sub Contractors**
  - Kent Whitfield, Spire Solar Chicago
  - Chuck Whittaker, Endecon Engineering

Publishing of the IEEE P1547

- Is crucial to the ultimate development and expansion of the UL1741 document.
- This is more of an issue for the work under option years 1 and 2 of this project.
- Until it is published, we will work from the most recent draft of 1547.

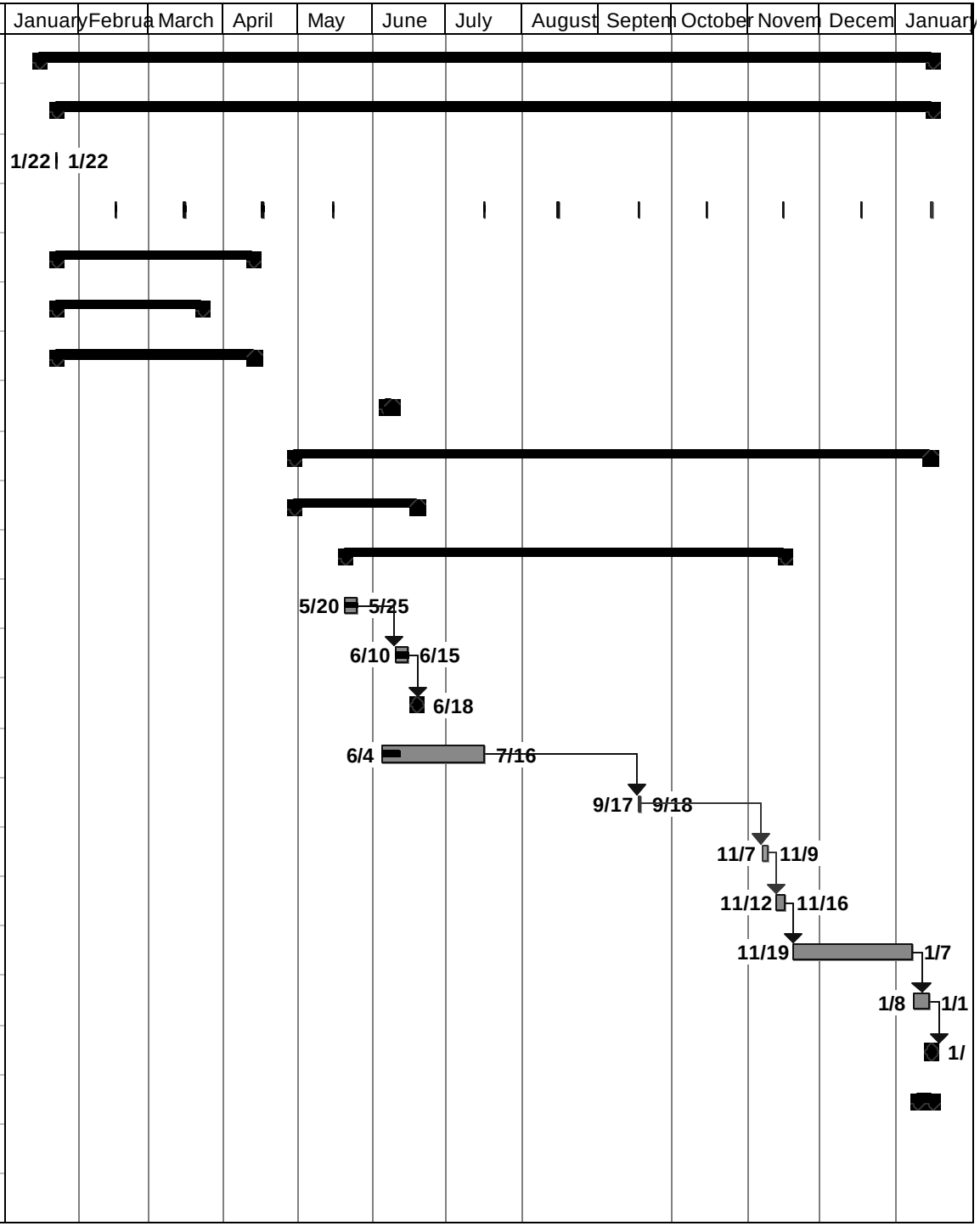
Related Work on IEEE P1547 and IEEE P1589 Documents

- UL Participation
- Lead discussions at last meeting in 1547 General Interest and Producers Groups to resolve negative ballot comments particularly in Testing Requirements Section 5.
- IEEE P1589 discussion on its creation and application to DG products in comparison to present day requirements and certifications
- Offline discussions with Utilities and Mfrs to discuss evaluation and real-world testing issues of DG products.

Major IEEE P1547 Items Being Added to UL1741

- Controllers for rotating generators
- Source Requirements for other DG types
- Procedures for new IEEE P1547 requirements
  - Surge withstand
  - Synchronization / loss of
  - Immunity protection
  - Flicker
  - Field verification test capability

ID	Task Name
1	**NREL/UL Distributed Generation Standard Development**
2	**Year 1 (1/15/01 - 1/15/02)**
3	Internal Kickoff meeting
4	**Monthly reports and Project Billing**
17	**Situation Analysis TASK 1 (D-1.2)**
27	**Literature Review TASK 2 (D-1.3)**
31	**NEC Review TASK 3 (D-1.4)**
43	**UL Standards Project TASK 4 (D-1.5)**
47	**Initial Draft Preparation TASK 5 (D-1.6)**
48	**Develop STP**
53	**Meeting with STP**
54	Develop agenda
55	Make arrangements for meeting
56	Send welcome packages
57	Draft document for STP review
58	Send invitations/agenda
59	Hold meeting
60	Prepare meeting report
61	Draft Document from STP input
62	Draft Progress Report
63	Send Report to NREL
64	**Annual report**
68	**Year 2 (1/16/02 - 1/15/03)**
69	**Year 3 (1/16/03 - 1/15/04)**



Base Year / 2001 Tasks Completed or in Process

• Perform Literature Review	• Completed
• Establish the STP group	• Completed
• Situation Analysis	• Completed
• NEC and other Interconnect Document Review and Report	• Completed
• Open UL Standards Project	• Completed
• STP Meeting Agenda	• Completed

Base Year / 2001 Tasks To Be Completed and Due Dates

• Create STP Agenda	• Completed
• Mail Agenda	• Completed
• STP Meeting	• 11/7-11/9
• Send meeting report to subscribers and STP members	• 12/11
• Meetings Report on STP	• 1/15/02
• Annual Report	• 1/15/02

STP Meeting Agenda, The issues listed below are the key areas UL has identified where revisions will be necessary

- 1) Revisions to harmonize with IEEE 1547
- 2) Addition of new DG source specific requirements.
- 3) Additions to address new product types or features.
- 4) Addition of references to other standards for the following requirements:
  - a) Energy storage devices,
  - b) Safety critical firmware,
  - c) Non-safety critical firmware, and
  - d) Transformers
  - e) Revisions to existing requirements
  - f) Discussion of GFDIs

Testing Research

- Working with equipment mfr's to design a large simulated utility for DG testing.
- Collaboration with Sandia Labs on the Harmonic Distortion testing and Anti-Islanding Testing
- Implementation of the Anti-Islanding Test loads for larger three phase products
- Researching DG Test equipment for data acquisition automation.

Summary

- The draft construction is under way we are prepared for our upcoming STP Meeting in November.
- We are on track with the work under this project and meet the requirements under the subcontract.

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